

## CANAL DEVELOPMENT

Even before achieving nationhood, Americans linked internal improvements with westward expansion, defense, and national union. Thus, after 1789 attention focused increasingly on developing better transportation routes along the eastern seaboard and in the interior. Projects included roads, turnpikes, bridges, and canals. In Maryland and Virginia the Potomac Canal Company and the Dismal Swamp Company completed canal projects by the mid-1790s. A flurry of canal building activity followed in Pennsylvania, New York, Massachusetts, South Carolina, and Ohio.

As they sought to improve transportation through canals, Americans looked to earlier successes in Britain. The British had built their canal system almost entirely without government assistance, but the United States did not enjoy the conditions which had made this possible. In America the terrain, existing patterns of settlement, and a shortage of investment capital and skilled engineers assured public participation in internal improvement projects. As a result, by the turn of the 19th century state governments began to assist private investors in canals by authorizing lotteries and subscribing stock.

The possible role of the federal government came under scrutiny in 1807 when Congress authorized Secretary of the Treasury Albert Gallatin to conduct a study of the nation's transportation problems. The result was Gallatin's "Report on Roads and Canals" issued in 1808. In presenting the first comprehensive plan for internal improvements, Gallatin identified a series of canals along the Atlantic coast, canals to connect the Atlantic with rivers in the West and with the Great Lakes, and roads and additional canals in the interior whose completion he deemed essential to the nation's future. In most cases Gallatin concluded that the financial requirements of these projects exceeded private resources. He proposed financing them with surplus funds from the United States treasury either through loans or stock subscriptions.

Beset by state and local jealousies and required to draw upon the budget surplus in preparing for war, Congress failed to enact Gallatin's plan. However, the War of 1812 underscored the importance of developing the nation's transportation system. A "Transportation Revolution" began after the war ended in 1815 and lasted until the Civil War. Canal development was a major factor in that revolution. At the beginning of the period canals totaling barely 1,000 miles in length notched the landscape from New Hampshire to South Carolina. By 1860 this figure had ballooned to more than 4,200 miles for projects that ranged west to Illinois, north to the Upper Michigan peninsula, and south to Texas.

Both private and public sources, including the federal government, provided the \$188 million invested in canals between 1815 and 1860. Aid from state and local governments was the decisive factor. New York, Pennsylvania, Ohio, Indiana, Illinois, and Virginia invested \$114.3 million in constructing and operating their own canals. Local municipalities joined eight states and the federal government and through stock subscriptions, gifts, and loans invested another \$22.2 million in mixed enterprises. Of this amount the federal government made \$1.9 million in stock purchases and \$400,000 in loans. The \$136.5 million public investment represented 73.4 percent of the total \$188-million investment in canals.

The 365-mile-long Erie Canal, completed between 1817 and 1825, was the largest of the state-owned ventures. After failing to get federal support, New York State financed the entire project through special taxes, loans, and toll revenues. For all projects, including the Erie, loans were the largest single source of funds. Loans accounted for about \$127 million, or more than 90 percent of government contributions to canal building. At least three-fourths of the loan money was obtained through bond sales to financial institutions, both domestic and foreign.

Toll revenues on the Erie Canal were substantial. New York collected more than \$1 million in tolls before the canal was finished. The tolls, usually based on the weight of the cargo, became part of the Canal Fund and as such were used to reduce the debt, make repairs, construct new canals, and enlarge the original canal. By 1836 toll income from the Erie and Champlain canals exceeded expenditures by more than \$1 million annually.

The federal purchases of stock in canal companies, all made between 1825 and 1829, followed renewed debate on the federal role in internal improvements. After 1815, John C. Calhoun, first as a congressman from South Carolina and then as Secretary of War, was a leading advocate of internal improvements. In 1816-1817, he pushed through Congress the so-called Bonus Bill to provide funds for the improvements. The bill, vetoed by President James Madison on constitutional grounds, would have created a permanent fund for building roads and canals using the bonus and annual dividends from the Second Bank of the United States.

In 1819, Calhoun, as Secretary of War, presented his own plan for constructing public works. His proposal drew heavily upon the earlier Gallatin plan. Like Gallatin, Calhoun conceded that many projects could be left to local entities, but he maintained that certain essential projects were beyond the capacities of the individual states. Calhoun, as had Gallatin, placed primary emphasis on the need to develop the line of communications along the Atlantic coast. "It must be perfected by the general government," Calhoun maintained, "or not be perfected at all." In regard to

communications with the interior, Calhoun argued that the government ought to "at least bear a proportional share of the expense of their construction." Again echoing Gallatin, Calhoun proposed that federal funds be channeled through stock subscriptions to state or privately owned companies that were undertaking approved projects. When Congress finally made the stock purchases, it viewed them favorably. The appropriations required were comparatively small; and, with private investors involved, Congress hoped the projects would be chosen wisely and the funds would be spent economically.

The largest mixed enterprise was the Chesapeake and Ohio Canal to which the federal government subscribed \$1 million in stock; Maryland \$6 million; Georgetown, Alexandria, and Washington \$1.6 million; and Virginia \$820,000. The Chesapeake and Delaware Canal, another mixed enterprise, sold \$1.2 million in stock, about two-thirds of which came from state and private sources. The federal share was \$450,000. The United States also purchased \$200,000 in Dismal Swamp Canal stock and \$235,000 in Louisville and Portland Canal stock. In 1837 Congress agreed to loan \$300,000 to the Alexandria Canal Company in exchange for stock in the company provided by the city of Alexandria, Virginia. This loan, in addition to an earlier \$100,000 loan to the Alexandria company, was the only instance of a federal loan to finance canal development.

The legislation authorizing stock purchases in canal companies stipulated that the federal government would periodically receive its proportion of the canal tolls. In reality, however, dividends were rare. One exception among the canals in which the federal government invested was the Louisville and Portland Canal. In the first 10 years of the canal's operation, the government received \$257,778 in dividends on its stock. This amount was greater than the original purchase price. From the record, "it appears the United States collected more in tolls at the Louisville Canal prior to 1860 than it expended on the improvement of the entire Ohio River."

During Andrew Jackson's presidency, the federal government abandoned the practice of purchasing stock in improvement companies. Land grants, another form of federal canal aid, had begun in 1827 and continued until after the Civil War. These grants were made in addition to rights-of-way and were designed to give the states and private companies involved the means to raise capital for canal construction through the sale of land. The first grant of 1.5 million acres of public land went to Indiana for the Wabash River-Lake Erie Canal. The last grant for 100,000 acres went to Michigan for the Lac La Belle Ship Canal in 1866. In total, the government gave away nearly 4.6 million acres to Indiana, Ohio, Illinois, Wisconsin, and Michigan.

In making these grants Congress stipulated that each canal was "to remain a public highway for the use of the government of the United States, free from any toll, or other charge, whatever, for any property of the United States, or persons in their service passing through." This policy predated the Constitution. The Ordinance of 1787, which provided territorial government for the Old Northwest, declared that the Mississippi River, the navigable waters leading into it and the Saint Lawrence, and "the carrying places between the same, shall be common highways, and forever free." Broadening this language, the Constitution stated: "No preference shall be given by any regulation of commerce or revenue to the ports of one State over those of another; nor shall vessels bound to, or from, one State, be obliged to enter, clear, or pay duties in another." Later, enabling acts admitting new states and state constitutions carried on the policy. The canal land grants were contingent upon construction commencing within five years and reaching completion within twenty years.

Calculating the value of the federal land grants for canals is difficult given the lack of information on actual land prices at the time of sale. One method is to determine the price of public land per acre in each year that a grant was made and multiply that price by the percent of total land which was granted in that year. The result is a weighted average price of \$1.058 per acre which should be regarded as the low estimate. Using this price, the total value of federal land grants for canal construction through 1866 is calculated to have been at least \$4.9 million. Thus, for the first grant of 1.5 million acres to Indiana for the Wabash and Erie Canal, the lowest value of the grant was \$1.57 million. Compare this to the \$8.2 million total cost of completing the canal.

Beginning in 1841 Congress also made land grants of 500,000 acres that were used for improvements that sometimes included canals. Acts admitting states with public lands to the Union also included provisions that set aside 5 percent of net proceeds from the sale of the lands for improvements, which for the acts passed before 1836 usually included canals.

Calhoun's 1819 plan for internal improvements had also included a proposal that federal assistance include using Army Engineers to make the surveys and plans for the projects contemplated. Such technical advice was a particularly valuable form of assistance during the canal-building period because skilled civilian engineers were in scarce supply. Before Congress approved the idea in 1824, Calhoun used the existing Board of Engineers for Fortifications to make surveys along the Atlantic coast. Also, in 1823 President Monroe recommended that Army Engineers survey routes for the Chesapeake and Ohio and other canals. Monroe affirmed his support of federal aid for improvements of national value, but he drew the line when it came to construction and operation of the works.

In 1824 Congress finally passed the General Survey Act. The act authorized the President to obtain surveys, plans, and cost estimates for the road and canal routes he deemed of national importance. He had authority to employ two or more civil engineers, Engineer officers, and line officers detailed to the Corps of Engineers to make the surveys. The initial appropriation was for \$30,000. Notably, the act did not authorize federal construction.

To implement the surveys, President Monroe appointed a Board of Internal Improvements. Petitions for surveys flooded Washington. During its first year the board concentrated on canal surveys, with the Chesapeake and Ohio Canal given the most attention. The board also made reports on the Dismal Swamp and the Chesapeake and Delaware canals and examined proposed canal routes in Pennsylvania, Maryland, Indiana, Florida, and New England. By 1827 the area of consideration had broadened; it stretched from New England to Florida and from Lake Erie to the Gulf of Mexico.

For the period through 1 December 1828, nearly \$74,000 was expended for surveys on the Chesapeake and Ohio Canal route; \$20,000 for surveying a canal to link the Atlantic and Gulf of Mexico across Florida; and nearly \$17,000 for surveys in Indiana that included mapping possible canal routes and clearing river obstructions. Before the Topographical Bureau took over the surveys from the Board of Internal Improvements in 1831, government surveyors had examined all the main routes proposed by Gallatin and Calhoun and numerous others. The number of officers engaged in the surveys, initially authorized at 24, increased to 53 in 1826.

The Topographical Bureau continued surveys under the General Survey Act until Congress repealed the act in 1838. During these last years, the nature of the surveys changed considerably. In 1831 most surveys were for canals, but by 1835 surveys for roads, railroads, and river and harbor improvements predominated. There was one canal survey in 1836 and none the following year. Several factors accounted for the virtual disappearance of the canal surveys. President Jackson and his Secretary of War did not generally support such activity; and the growth of railroads, not canals, became the most significant manifestation of the ongoing transportation revolution.

Despite the growth of canals in the pre-Civil War period and their impact on the developing American economy, the number of abandoned canals exceeded those constructed in the decade before 1860. During the Civil War railroads enhanced still further their position as the preeminent mode of inland transportation, but the strongest canals survived. In fact both the Erie and the Chesapeake and Delaware canals experienced their highest tonnage to date in 1872. Afterwards, however, a decline was also noted on these popular routes.

After the Civil War the appeal of waterways transportation persisted. In 1874 the Senate's Select Committee on Transportation Routes to the Seaboard, the Windom Committee, issued a report recommending the improvement of specific water routes to lessen overall transportation costs. In essence the committee saw competition from waterborne commerce as a means of checking railroad rates which were already deemed excessive. The committee envisioned a transportation network that would still include canals and rivers improved through canalization.

In part the committee report focused attention on a water passage from the Tennessee River to the Atlantic, known as the Southern Route. Improvements at Muscle Shoals, Alabama, were an essential element of this project. The state had completed a canal at Big Muscle Shoals in 1837, but subsidiary canals above and below this location were not finished. Now, with Congress's blessing, the Army Corps of Engineers undertook to rebuild and expand the old canal and construct the subsidiary canals. The Muscle Shoals Canal opened in 1890, by which time federal expenditures totaled approximately \$3.1 million.

In 1874 the United States also took over full control of the Louisville and Portland Canal for \$1.7 million. Ownership of the canal had actually passed to the United States in 1855 because the private investors involved had used the dividends due the federal government to buy out all but five shares of their stock. When Congress refused to take a greater role, the remaining stockholders continued to oversee the canal's operation. This canal had been the most profitable of those in which the United States held stock, but the high cost of recent improvements and strong objections to the tolls charged led to a complete federal takeover. In accordance with established practice on federally owned waterways, Congress eliminated the tolls on the Louisville and Portland Canal in 1880. Thereafter Congress paid the cost of operation and maintenance from the Treasury.

In 1894 attention focused again on another canal in which the federal government held stock, the Chesapeake and Delaware. A movement began to construct a ship (lock-free) canal linking the Delaware and Chesapeake bays. After much debate it was decided that the ship canal would follow the route of the existing lock canal. The canal had seen little use since the 1880s and had not paid dividends since 1877. The Chesapeake and Delaware Canal Company lacked the funds to make the necessary enlargements for a ship canal. Thus in 1919 the federal government purchased the old canal in full for \$2.5 million. The Corps of Engineers' Wilmington District Engineer directed reconstruction which was completed in 1927 at a cost of \$10.1 million for a 12-foot depth. No tolls were charged on the new waterway.

Another private company, the Cape Cod Canal Company, also lacked the funds to maintain its canal which stretched 17 miles between Buzzard's and Barnstable bays. After determining the canal's military and commercial value, the United States purchased the Cape Cod Canal in 1928 for \$11.5 million. The government immediately abolished tolls on the waterways, and cargo tonnage rose dramatically in response. Between 1935 and 1940 the Corps of Engineers reconstructed the canal with Public Works Administration, Emergency Relief Administration, and regular improvement funds, which, when added to the original cost and maintenance, brought federal investment in the project to nearly \$37 million by 1940. By 1975 the federal investment had more than doubled, making the Cape Cod Canal the most costly single civil works project of the Corps of Engineers in New England. Today the Cape Cod Canal is the widest sea-level canal in the world and in the 1970s was carrying about 11.7 million cargo-tons annually.

The inability of the state of Illinois to complete improvements on its portion of the original Illinois Waterway between Lockport and Utica led to federal takeover without charge in April 1930. Thus the United States gained full control of an important water route from Lake Michigan to the Mississippi River, a route which included the canals of the Chicago Sanitary District. The state had appropriated \$20 million for its portion of the waterway. Congress added \$7.5 million and completed the project in 1933.

During the New Deal the federal government also became involved in the project to enlarge the existing network for New York canals, including the Erie, known then as the Barge Canal. In 1935 the Emergency Relief Appropriation Act allotted federal funds to New York to deepen the portion of the canal from Waterford on the Hudson to Oswego Harbor on Lake Ontario from 12 to 14 feet and to widen the canal so that it could be fully used at the new depth. The estimated cost of the project was \$27 million of which \$20 million was to come from the federal government. New York District of the Corps of Engineers supervised the work and completed it in 1968.

As this study of canal development has shown, although America's great canal age occurred before the Civil War and even then gave way to a railroad boom, federal investment in canals in the late-19th and 20th centuries far outdistanced investment in the earlier period. Not only did the federal government make loans and outright grants of funds, direct construction to enlarge existing canals, and contribute to operation and maintenance, but the federal government also purchased several major canals and has continued to operate them. As held true earlier, state and local investment in canals continued to exceed federal investment.

Obtaining complete figures on canal expenditures is extremely difficult. According to statistics reported by the Federal

Coordinator of Transportation in 1939, state costs for construction, maintenance, and other charges relating to canals, less the amount of tolls collected, were \$530 million. Of this amount \$330 million was expended after 1890 and most of that was for construction and operation of the New York State Barge Canal and the Chicago Sanitary and Ship Canal. As of 30 June 1929, the Chief of Engineers reported total federal expenditures of \$96 million as a separate item, "operating and care of canals." This figure is below the amount actually spent because some canal costs have been included in categories with noncanal expenditures and cannot be extracted.